

## CLAIMS:

What is claimed is:

1. A method for depositing an inorganic material from a reactive solution onto a substrate, comprising:
  - 5 chemically treating said substrate to activate growth of said inorganic material;
  - immersing said substrate into said reactive solution; and
  - regenerating said reactive solution to allow for continued growth of said inorganic material onto said substrate.
2. The method of claim 1 wherein the inorganic material is a silicon oxide.
- 10 3. The method of claim 1 wherein the substrate is a silicon wafer.
4. The method of claim 1 wherein the substrate is a component of a semiconductor chip.
5. The method of claim 1 wherein the substrate is a component of a nano-based chip.
6. The method of claim 1 wherein the inorganic material forms an optical waveguide.
7. The method of claim 1 wherein the reactive solution is comprised of  $\text{H}_2\text{SiF}_6$  and  $\text{H}_2\text{O}$ .
- 15 8. The method of claim 1 wherein the reactive solution is regenerated by the addition of silicon.
9. An apparatus for depositing an inorganic material from a reactive solution onto a substrate comprising:
  - a first container;
  - 20 said reactive solution disposed within said first container;
  - said substrate immersed in said reactive solution;
  - a second container;
  - a quantity of silica disposed within said second container ; and
  - a means for adding a portion of said quantity of silica to said reactive solution.
- 25 10. The apparatus of claim 9 whereby the means for adding said portion of said quantity of silica to said reactive solution is a pump in fluid communication with said first container and said second container.
11. The apparatus of claim 9 wherein the inorganic material is a silicon oxide.
12. The apparatus of claim 9 wherein the substrate is a silicon wafer.
- 30 13. The apparatus of claim 9 wherein the reactive solution is comprised of  $\text{H}_2\text{SiF}_6$  and  $\text{H}_2\text{O}$ .
14. The apparatus of claim 9 further comprising:
  - a third container; and
  - a second quantity of silica disposed within said third container.

15. The apparatus of claim 14 whereby the means for adding said portion of said quantity of silica to said reactive solution is a pump in fluid communication with said first container and said third container.